

PPR Vaccines and Vaccinations

Dr Viola Chemis & Dr. Simon
kihu

PPR Secretariat – WOAHA Delegation

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World
Organisation
for Animal
Health
Founded as OIE

Organisation
mondiale
de la santé
animale
Fondée en tant qu'OIE

Organización
Mundial
de Sanidad
Animal
Fundada como OIE



Outline

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4. Vaccination Strategy
5. Monitoring and Evaluation
6. Vaccine Bank
7. Conclusion

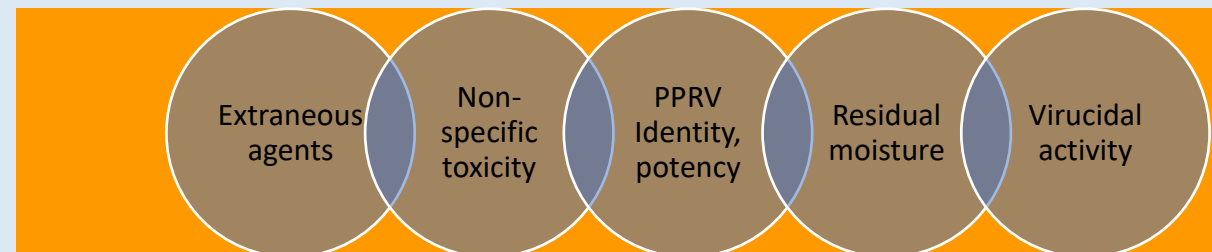


Introduction:

- PPR caused by PPRV, a genomic RNA with 6 structural proteins; **One serotype**; 4 strains, i.e., I, II, III & IV genotypes; all in Africa
- An animal recovered from one PPRV strain or that has been vaccinated develops immunity and protected against infection by any other PPRV strain.
- Commercially; Live attenuated PPRV vaccines - Nigeria 75/1, lineage II and Sungri 96, lineage IV provide complete cross lineage protection and no adverse effects in field use = long-term protective immune response
- Antibodies to PPRV detected 1 week after PPRV infection or vaccination
- Passive Immunity = 3-4 months
- Thermostable PPR vaccine now available commercially
- DIVA technology is under development

PPR Vaccine Quality

- Use quality controlled vaccines
- Vaccine quality controlled by an independent institution recognized by WOA (AU-PANVAC).
- Vaccine Quality Control Certificate (QCC) issued by independent institution should be made available to the buyer
- Cold chain management in entire vaccine chain
- Once reconstituted, within 30 – 60 minutes; Water for diluent is a NO





Vaccination Planning

A. Communication strategy = Acceptability

Target all stakeholders & public

Objectives

Potential benefits

Appropriate timing/schedule

Roles and responsibilities

B. Infrastructure and logistics

Animal Handling facilities

Cold chain

Vaccine Procurement + distribution

Livestock location, transport + supervision

Data collection + technology

Animal marking/identification

C. Human Resource

Trained and authorized personnel

Teams - periodic training sessions and updating written SOPs for field use;

Sufficient teams – timeframe + coverage

Teams adequately equipped + transport animals

Supervision



Vaccination planning

- **Timing** vaccinations, appropriate **location** and **flock mobilization** key especially in less equipped, remote/difficult, pastoral areas as it impacts **vaccination coverage**; (**livestock traceability/mobility** and **census important tool**)
- Maintenance of **detailed records** of vaccinated population; consider issuing official certificates of vaccination status of animals (or group of animals)
- Conduct **Baseline**: Before vaccination (or on day of vaccination) especially in enzootic zone, conduct a sero-survey to establish baseline prevalence of PPR antibodies within target population
- **Monitoring** and evaluation of vaccination program: to inform **timely** corrective measures: **coverage**, population immunity, frequency and severity of side effects, disease incidence, prevalence and impact of disease
- Animal identification to allow differentiation of vaccinated from unvaccinated animals; for monitoring the vaccination. Can use temporary or permanent identifiers, individual or group based (chapter 4.2, and 4.3 WOA code)
- Post vaccination serology surveys ; **at least 70% serology response needed for success**
- Exit strategy: Requirement for PPR freedom, contingency plan, enhanced biosecurity, sanitary measures and surveillance for early detection => National Eradication Strategy (GCES)
- Note: Indiscriminate vaccination can mask underlying infections, affect surveillance and have implications for movement of vaccinated animals



Planning
Vaccination:
Combined
Activities

Vaccination against other priority SR pathogenic agents,

Treatment of sick animals,

Biosecurity,

Surveillance,

Animal identification and

Communication

Baseline sero-survey (all above informs team composition).

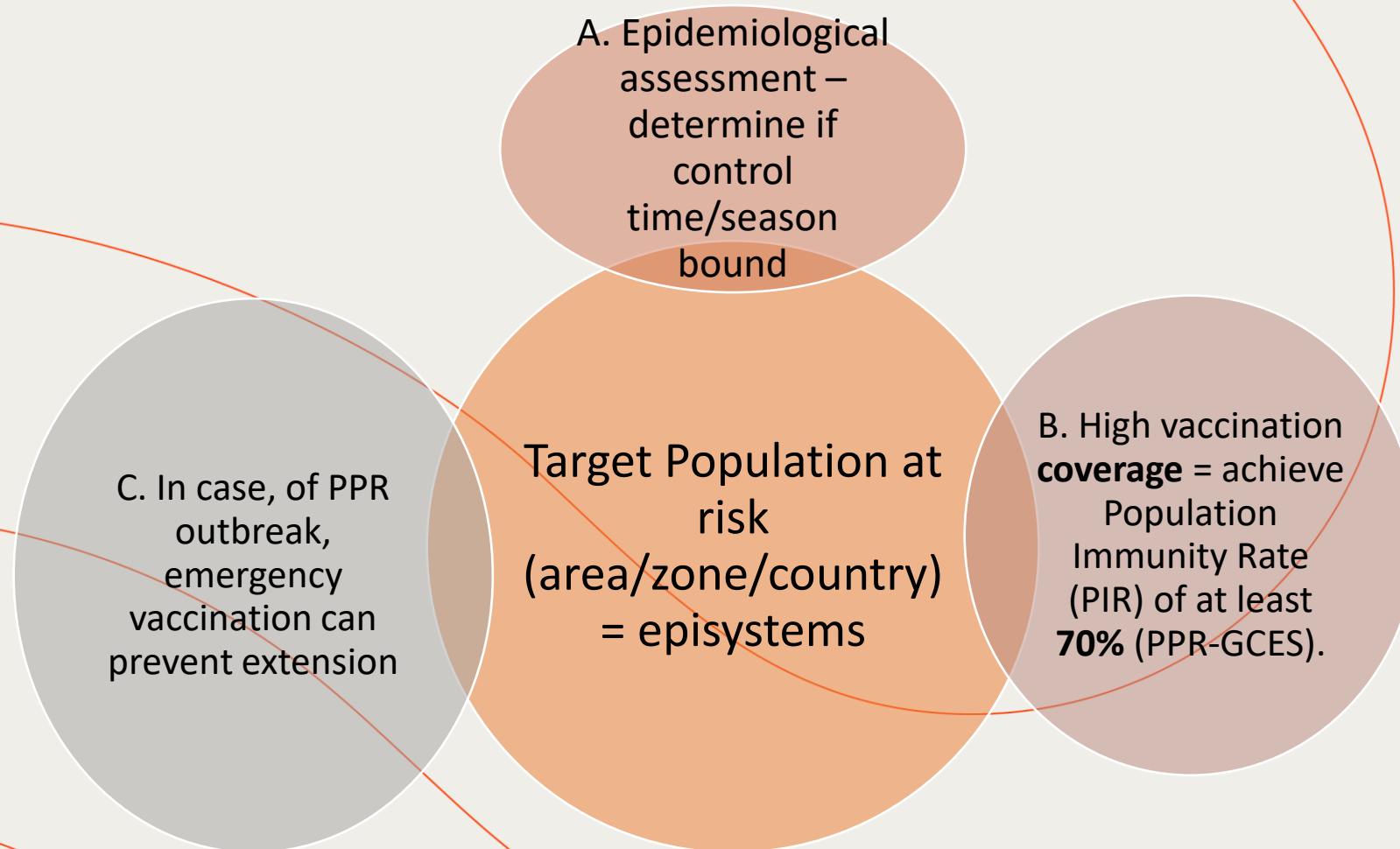


- **Combined Activities**
 - **Combination** of PPR vaccination with other **priority SR diseases** is highly **cost-effective**, as major cost related to delivery system of vaccine (storage, transport, technical staff, supervision, others logistical arrangements, etc).
 - Delivery costs do not change much if interventions targeted to one or more diseases.
 - Targeted other SR disease should be of priority to the VS, of the country and region. e.g SGP, (also controlled by LAV vaccines produced in cell cultures)



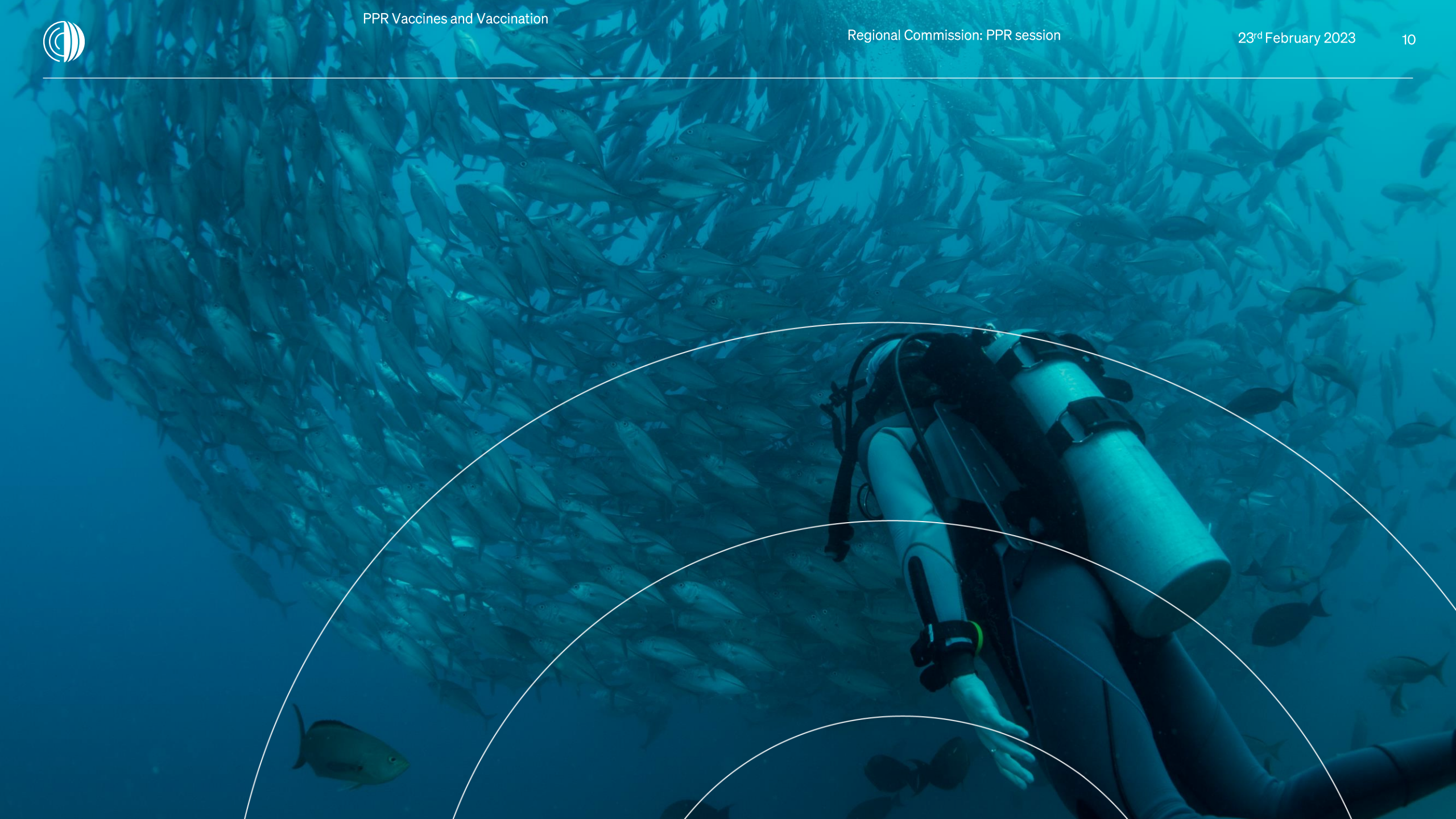
Targeted Vaccinations





High coverage vaccination is more efficient for PPR control & eradication and **less costly** than continuous, low coverage annual vaccination campaigns.

Hammami et al. (2018) noted that **vaccination coverage must be higher than 60%** in order to reach the 70% threshold for post-vaccination immunity rate recommended in GCES. PIR, case of experience from Morocco during its first outbreak in 2008





Targeted Vaccination:

- Most feasible control strategy in endemic countries, at stage 2 PMAT

Epidemiological Assessment = determine at risk population

Whether 1/2 vaccinations/year depend on epidemiological situation and animal production system in target areas

Flock population turnover/dynamics

Vaccinate animals >4 months every 2 years

Followed by 1 or 2 years of vaccinations, only new animals or those < 4 months in previous plan

Exit strategy

- Flock population turnover/dynamics (births and other introductions of unvaccinated animals on one hand vs deaths, commercial offtake on the other hand). E.g. Turnover may be higher in commercial farms as opposed to pastoral systems
- Exit strategy: Requirement for PPR freedom, contingency plan, enhanced biosecurity, sanitary measures and surveillance for early detection => National Eradication Strategy (GCES)



Effectiveness of vaccine delivery system

- i. Cold chain in vaccine delivery
- ii. Host receives correct vaccine dose;
- iii. Vaccine storage no more than 2 or so years;
- iv. Reconstituted vaccine used within 30-60 minutes
- v. Quality diluent; Water (even good quality) must never be used as diluent as it will result in dramatic reduction of vaccine titer
- vi. Teams have sufficient vaccines at the right time
- vii. Timing, location and flock mobilization key enable by *livestock traceability/mobility and census* so as to calculate vaccination coverage;
- viii. Achieve at least 70% immunity upon post vaccination serology surveys



Monitoring and Evaluation:

Regular checks/evaluations of possible sources of vaccination failures:

- a) Vaccine quality – vaccine samples must be collected randomly and submitted for quality control, even if quality certificate was provided by producer
- b) Vaccine storage – Cold chain in entire vaccine chain to administration
- c) Quality of veterinary services – skilled staff, public and private in vaccination teams and supervised
- d) Vaccine coverage – at least 70% target population; needs careful planning, livestock owners' sufficient mobilization

- Conduct Baseline: Before vaccination (or on day of vaccination) especially in enzootic zone, conduct a sero-survey to establish baseline prevalence of PPR antibodies within target population
- Post vaccination sera collection to:
 - Evaluate vaccination effectiveness by estimating number of epidemiological units that show sero-conversion after each round of vaccination
 - Evaluate population immunity at a given time after several vaccination campaigns by comparison with results prior to vaccination of target population



WOAH PPR Vaccine Bank

- Established in 2012
- **Voluntary mechanism** which can be activated at the request of countries
- Objective: to ensure the procurement of high-quality vaccines manufactured in line with WOAHA standards and delivered in a timely manner for the benefit and use of WOAHA Member Countries
- WOAHA's Policy Paper on Vaccine Banks, published in 2018 to clarify the role and responsibility of the WOAHA and of countries benefitting from the mechanism
http://www.oie.int/fileadmin/Home/eng/Links/docs/pdf/Policy-Paper-VB-final-FR_Oct-2018.pdf
- More than **80 million doses delivered** to countries in Africa so far (in particular for the implementation of the PRAPS project in Western and Central Africa-PRAPS).
- Following a new international call for tender launched in 2021, two manufacturers were selected based on technical and financial criteria, namely MCI Santé Animale and Hester Biosciences : the WOAHA is able to provide a thermotolerant PPR vaccine through its PPR Vaccine Bank.



WOAH Vaccine Bank

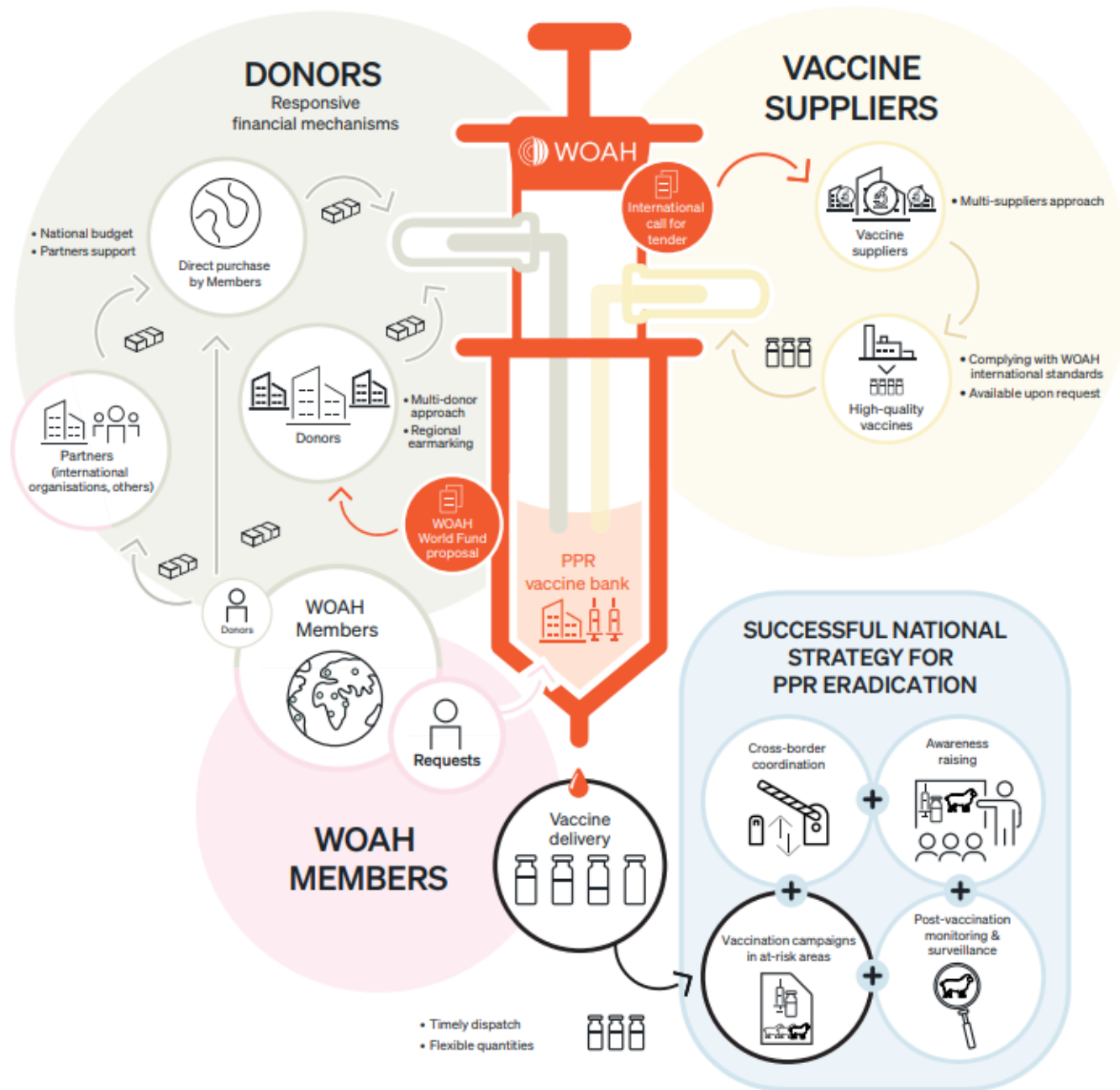
Planned deliveries

Rapid supply

Thermotolerant

Access to quality:

- Efficacy
- Safety





PPR Vaccine Bank - How to submit a request

TEMPLATE JUSTIFICATION OF A VACCINE REQUEST AND OVERVIEW OF THE VACCINATION PROGRAMME AGAINST PESTE DES PETITS RUMINANTS (PPR) IN YOUR COUNTRY

1. Description of the epidemiological situation

Provide a brief description of the epidemiological situation of the disease, including number of outbreaks during the last 2 years. Please provide a map when appropriate. This can be provided as a separate document.

2. Description of the disease control measures already implemented

Vaccination Stamping out Movement restriction Others

Please, provide a brief description (in case vaccination is being implemented, please indicate if the vaccinated animals are identified):

3. Vaccination programme¹

3.1. Objectives of the vaccination

Please, describe the main objectives of the vaccination strategy and where you will implement the vaccination campaigns. Please provide as an annex your national legislation on vaccination and the disease eradication strategy (or a summary of this strategy), if there are any.

- Easy and streamlined process
- Submit an official letter from the WOAHA Delegate to the WOAHA Director General
- Complete the Justification Form presenting the situation and the need for PPR vaccines
- Identify funding for the vaccines before sending the official request to the WOAHA
- Liaise with the corresponding WOAHA Regional Representation if any question before sending the request
- ❖ ***After the vaccination campaign has been implemented: provide to the OIE a final report***



- Conclusion:
1. PPRV vaccine induces life-long immunity in animals that have recovered from infection
 2. Induced immunity is a sterile immunity as no carrier state follows the recovery from an infection (not known yet)
 3. Existence of only one virus serotype, i.e., a single vaccine strain will protect animals against all other strains
 4. Affordable vaccines that can be produced and delivered at low cost (dependent on delivery system)
 5. Specific and highly sensitive diagnostic tests available for surveillance and detection of PPRV
 6. Thermostable (TT) vaccines commercial availability on scale
 7. DIVA vaccines technology is under development

Thank you



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